

**THE INFRARED IMAGE OF THE MOON TRANSMITTED BY GEOSTATIONARY SATELLITE GOMS.** S. G. Pugacheva, V. V. Shevchenko, Sternberg State Astronomical Institute, Moscow University, Moscow 119899, Russia, shev@sai.msu.su

In thesis's of Lunar and Planetary conference 1996 [Pugacheva S.G., et. al. (1996) Lunar Planet. Sci. XXVII, 1061-1062] a method of calibration of the spectrophotometric observations of the Earth from the satellite GOMS was adduced. As the natural standard of the calibration the image of the Moon is used in visible (0,45 microns) and IR (10-12 micron) of the spectrum. Scanning image of the Moon, transferred by satellite, is reproduced on the screen of the computer. The electrical signals are normalized to values of brightness and temperature of a surface of the lunar sites with the help of the computer data base. Computer models visible and IR the image of the Moon to any phase angle and time observation. The algorithm of the numerical model uses the empirical formulas of the dependence between brightness, albedo, temperature of the lunar surface and angle parameters of the illumination and observation. In the present thesis's technical parameters of a geostationary satellite GOMS and images of the Moon from a satellite in visible and IR ranges of a spectrum are given.

October 31, 1994 in Russia was started artificial Earth satellite GOMS first of a new series of the geostationary satellites with instrumentation for realization of the hydrometeorologic observations. In difference from others space meteorologic system of the observation, based on use of the polar orbit in altitude about 1000 km, the new satellite GOMS is deduced into circle equatorial geostationary orbit. The coordinate of the satellite is  $76^{\circ}$  E. The orbital altitude makes 35,8 thousand km. The satellite GOMS has three-axes orbital eqientation, and one axes is directed to a nadir, other - on vector of speed.

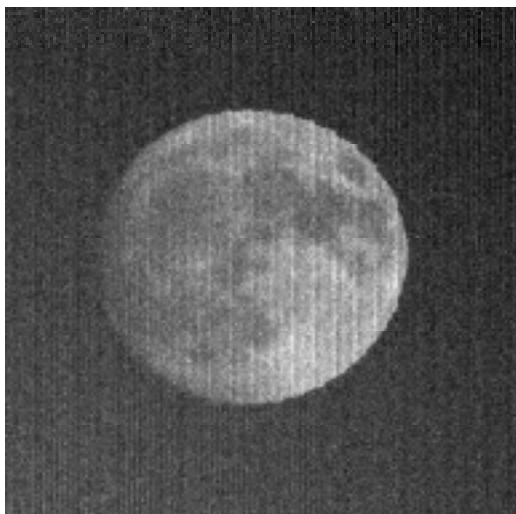
For realization of meteorological observations satellite GOMS has television complex, which gives in actual time scale of the digital images of a cloudy, snow and ice

cover and measures radiation temperature of a surface of an ocean, land and high bound of a clouds. The instrumentation for survey represents a two-channel television system with two-coordinate optical mechanical scanning of the space within of the angle sector  $18^{\circ} \times 18^{\circ}$ . In this sector whole disk of the Earth is entered. One frame is removed for 13,5 min scanning of the image in meridian direction. In an optical system of the satellite GOMS is using object mirror in diameter 400 mm. Surveying of the Earth is made simultaneously in two spectral ranges: visible 0,4 - 0,7 microns and infra-red 10,5 - 12,5 micron. Eight receivers of the radiation works in a visible spectrum diapason, and two receivers works in IR spectrum. An instantaneous field of the vision in a visible band makes 6,3 second, in IR - 22,5 second. IR channel is registered heat flows from objects with radiation temperature within the limits of 213-313 K. A level of the instrumentation noise does not exceed 1 K.

Fig.1. The scanning image of the Moon from the satellite GOMS in a visible spectrum 0,4-0,7 micron. The phase angle is  $+22^{\circ}$ . The size of the image is 400 x 400 pixels. Space resolution is 6,3 second on a pixel.

Fig.2. The scanning image of the Moon from the satellite GOMS in a IR spectrum 10,5-12,5 micron. The phase angle is  $+22^{\circ}$ . The size of the image is 160 x 160 pixels. Space resolution is 22,5 second on a pixel. On the image the isotherms of the IR radiation temperature are the system of concentric circles with center in subsolar point. Within the limits of a central light spot radiation temperature of a surface is higher than a upper limiting level registration of a heat flow by an equipment of the satellite, that is more 313 K, to an edge of the disk radiation temperature of a lunar surface decreases up to 300 K.

INFRARED IMAGE: MOON: S. G. Pugacheva, V. V. Shevchenko



Figure

1.

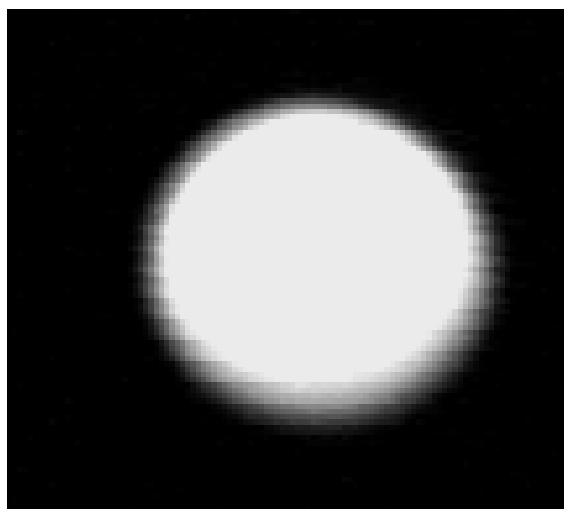


Figure 2.